

REMARKS

Applicants have fully considered the Non-Final Office Action of April 2, 2004. Applicants request reconsideration of the application. In view of the following remarks and arguments, Applicants request that the rejections of the claims be withdrawn and that a Notice of Allowance be issued.

In the Office Action, the Examiner rejected claims 2-33. Please cancel claims 5, 7-12, 19-20, and 33 without prejudice. Claims 2-4, 6, 13-18, and 21-32 remain pending.

The Examiner rejected claims 2-33 under 35 U.S.C. 103(a) as being unpatentable over EP 0402269. Applicants traverse this rejection.

Applicants submit that the Examiner has not made out a *prima facie* case of obviousness in view of EP 0402269. The Examiner has not pointed to any specific portions of the reference outside of the disclosure of a general formula and variations thereof. The Examiner merely states that in view of the disclosure of a broad formula with many variations it would have been obvious to a person skilled in the art to modify the variations of the reference within the limitations of the instant claim. The fact that a person skilled in the art *could* modify the reference does not render a claim obvious unless the prior art suggests the desirability of the modification. M.P.E.P. 2143.01. The Examiner has not shown where the EP reference teaches or suggests modifying the structures disclosed therein to arrive at the claimed polythiophenes.

Additionally, the Examiner has not shown where EP 0402269 teaches or suggests every feature set forth in the claims. M.P.E.P. 2143.03. For example, the Examiner has not shown where the reference teaches or suggests a polythiophene of the formula set forth in claim 2 with a number average molecular weight of about 2,000 to about 100,000, a weight average molecular weight of about 4,000 to about 500,000, and a conductivity of from about 10^{-6} to about 10^{-9} S/cm.

Applicants further submit that the claims are not obvious in view of EP 0402269. Applicants have not been able to obtain a translation of EP 0402269, but from what Applicants can infer from the title, EP 0402269 is directed to the preparation of oligomers with heterocyclic aromatics. As previously addressed in Applicants response of July 9, 2003, oligomers will behave differently from polymers and may not perform well as thin film transistors. Thus, a person skilled in the art

would not be motivated by the teachings to modify EP 0402269 to arrive at the polythiophenes set forth in the claims.

Thus, in view of the foregoing, Applicants submit that the Examiner has not established a *prima facie* case of obviousness and that EP 0402269 does not render pending claims 2-4, 6, 13-18, and 21-32 obvious. Applicants request that the rejection of the claims in view of EP 0402269 be withdrawn.

Claims 2-4 were rejected under 35 U.S.C. 103(a) as being unpatentable over WO 9415368, or the Sato reference, or the Van Hutten reference which were made of record on a Form 1449 filed May 30, 2003. Applicants traverse this rejection.

Applicants submit that none of the WO 9415368, Sato, or Van Hutten references render claims 2-4 obvious.¹ Applicants submit that WO 9415368 does not render claims 2-4 obvious. The polymer set forth in WO 9415368 differs from the polymer set forth in the claims in that the polymer of WO 9415368 requires thiophene blocks sandwiched between non-thiophene blocks. The Examiner has not shown where WO 9415368 teaches or suggests eliminating the non-thiophene blocks to arrive at the present polymers. Figure 7 is only a dibromo thiophene precursor used in the synthesis of a polymer containing the non-thiophene SiMe₂ unit (See Figure 8). Considering the reference as a whole, WO 9415368 does not render claims 2-4 obvious.

Applicants submit that claims 2-4 are not obvious in view of Van Hutten. Applicants submit the Examiner has failed to show that the Van Hutten reference teaches or suggests every feature of independent claim 2. The Examiner has failed to show where Van Hutten teaches or suggests a polythiophene with a number average molecular weight of about 2,000 to about 500,000, a weight average molecular weight of about 4,000 to about 100,000, and a conductivity of about 10⁻⁶ to about 10⁻⁹ S/cm. The mere fact that a person could modify the compositions of Van Hutten to arrive at thiophenes with the features set forth in claim 2 does not render claim 2 obvious. There must be a suggestion to modify the reference. The Examiner has not shown where Van Hutten suggests any such modifications. Because Van Hutten does not render claim 2 obvious, claims 3 and 4 which are dependent therefrom are also not obvious.

¹ Applicants submit that the Examiner is applying the WO 9415368, Sato, and Van Hutten references separately to claims 2-4 and not combining the references. This is based on the Examiner's use of the word "or" in the rejection and failure to use the word "and" when applying the references.

Applicants submit that the Sato reference does not render claims 2-4 obvious. The Examiner has failed to show where the Sato reference teaches or suggests every limitation of claim 2. Specifically, the Examiner has failed to show where Sato teaches or suggests a polythiophene as set forth in claim 2 with a number average molecular weight of about 2,000 to about 100,000, a weight average molecular weight of from about 4,000 to about 500,000, and a conductivity of about 10^{-6} to about 10^{-9} S/cm. At the least, Sato teaches oligomers with a weight average molecular weight below the range set forth in claim 2. There is no suggestion of the desirability of having a larger weight average molecular weight. Additionally, there is nothing in Sato to suggest the desirability of a polythiophene having a conductivity of about 10^{-6} to about 10^{-9} S/cm. While not disclosing any conductivities of the oligothiophenes disclosed in the reference, Sato actually teaches thiophenes having high conductivities. Specifically, Sato notes the interest in π -conjugated polymers because of their high electrical conductivities and notes a study of poly[3-(long alkyl)thiophenes] having conductivities from 10 to 95 S/cm. Thus, Applicant submits that Sato actually teaches away from the polythiophenes set forth in the present claims. The mere fact that a person could modify the disclosure to arrive at the polythiophenes set forth in the claims is not sufficient to establish a *prima facie* case of obviousness. There is nothing to motivate a person skilled in the art to modify Sato to arrive at the present claims other than through hindsight in view of the Applicants disclosure.

Claims 3 and 4 depend from claim 2 and include all the limitations of claim 2. Consequently, Applicants submit that Sato does not render claims 3 or 4 obvious. Applicants also submit that Sato does not teach or suggest polythiophenes of the formulas in claims 3 or 4. Specifically, Sato does not teach substituted thiophenes where there are two thiophene rings between the rings with the substituents. On which rings the substituents are located could affect the properties of the polymers. The Examiner has not shown where Sato teaches or suggests thiophenes having such a formula.

Further, Applicants note that Sato is directed to oligothiophenes. As stated in Applicants response to a previous Office Action, oligomers are small molecules, not polymers, and will behave differently than polymers. Thus, in view of the foregoing, Applicants submit that the Sato reference does not render claim 2, or claims 3 or 4 which are dependent therefrom, obvious.

In view of the foregoing, Applicants submit that neither WO 9415368, Sato, nor Van Hutten render claims 2-4 obvious. Applicants request that the rejection of claims 2-4 be withdrawn.

The Examiner rejected claims 5, 7, 9-12, 19, 20, 29, and 33 under 35 U.S.C. 112, second paragraph, as being indefinite. Applicants traverse this rejection.

Applicants submit that the rejection of claims 5, 7, 9-12, 19, 20, and 33 is moot as these claims have been cancelled. Applicants request that the rejection of these claims be withdrawn.

Applicants submit that claim 29 is definite. The Examiner stated there was insufficient antecedent basis for the limitation "IIIb" in line 2 of claim 29. Applicants note that claim 29 is clarified herein to remove the limitation "IIIb" and to insert a specific formula (which is labeled in the specification as monomer IIIb). Applicants submit that, in view of the clarification, claim 29 is definite. Claim 29 is also clarified by moving the location of the resultant polythiophene to the end of the claim. Applicants submit that the clarification to claim 29 is not made for reasons related to patentability but to merely clarify the claim. Applicants request that the rejection of claim 29 be withdrawn.

Claim 2 is clarified herein to remove a "/" right before the "S" in S/cm." The original slash was a typo. The clarification to claim 2 is not made for reasons related to patentability.

CONCLUSION

For the reasons detailed above, it is submitted all claims remaining in the application (Claims 2-4, 6, 13-18, and 21-32) are now in condition for allowance.

In the event the Examiner considers personal contact advantageous to the disposition of this case, he is hereby authorized to call Richard M. Klein, at telephone number 216-861-5582, Cleveland, OH.

It is believed that no fee is due in conjunction with this response. If, however, it is determined that fees are due, authorization is hereby given for deduction of those fees, other than the issue fees, from Deposit Account No. 24-0037.

Respectfully submitted,

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